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ABSTRACT

This study sought insight into the congruence between knowledge, skills and attitudes required by architecture practitioners and the benefits of professional school education. Twenty-four senior architects from Los Angeles architecture firms and 11 professional school deans and faculty members from the Graduate School of Architecture and Urban Planning at the University of California, Los Angeles, and the School of Architecture at the University of Southern California were interviewed over a 2-month period. Findings indicated uneven congruence between faculty and practioner opinions. Successful practitioners in architecture pointed to the importance of knowledge, skill and work attitude while faculty were adamant that knowledge of field was all that mattered. Faculty felt that formal education contributed more to professional effectiveness than work or life experience. Practicing architects on the other hand saw the benefit of knowledge, skill and work attitudes combined with work experience as the major contributor to professional effectiveness. Professional school faculty, despite their apparent indifference to job skills, interpersonal skills, and work attitudes as important competencies, perceived the professional school as the place to develop general job skills and interpersonal skills, while practicing architects felt that such competencies could be developed in schools, on the job, and in other life experiences. Includes 12 references. (LPT)

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The Congruence Between Industry Demand and Professional School Response in Architecture

A Paper submitted to American Education Research Association

Chicago

April, 1991

Ronald Hansen

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Introduction

The needs of architecture firms for competent entry-level architects with potential for making a contribution to the firm and to the profession are relatively simple. The making of a professional architect is complex. The intimate one-to-one communication that must have been possible between a successful practitioner and an apprentice fifty years ago, has been replaced by a system of universities and professional schools that try to simulate workplace conditions and problems in order to prepare aspiring professionals. The benefits of a university undergraduate education are well documented in the literature (Astin, 1977; Bowen, 1977; Trent, 1968). Very little has been done, however, to document the outcomes of a professional or graduate school education. The exception to this general observation is the emerging body of literature from representative professional associations. The National Council of Architectural Registration Boards in the United States, for example, released an 'activities and knowledge/skill requirements' report in 1981 and again in 1989 (NCARB, 1989). In engineering, the Goals Report and the National Study of Engineering document the evolving picture in this profession (Goals Committee Report, 1968; Engineering and Practice Report, 1985). Such reports provide us with an inventory of the

requirements and expectations held by the industry. For this contribution to the field, the professional schools can be grateful. What would now be helpful to educators is a paradigm for categorizing and synthesizing the many competencies. Can these competencies be organized and conceptualized in a coherent way? From such analysis can we determine how these competencies are best learned? Where they are best learned? In engineering this is done with modern laboratories. In business management case studies are used extensively. Architecture educators use the studio. How effective can a process be when so removed from everyday practice?

The research reported here focuses on the process through which architects prepare for successful practice. In question is the congruence between the expectations of business and industry, and higher education programs. What do employers require of professional school graduates and what do they expect of the professional school? From the higher education perspective, how well are professional schools preparing graduates for practice? For purposes of the paper, preparation for practice was equated with four elements of competence: Knowledge of field, job skills, interpersonal skills, and work attitude. Each element was defined and used as criteria against which preparedness could be determined. Performance and effectiveness on the job, it was assumed, result if a person has acquired and can demonstrate competence in these four areas. Higher education's effectiveness, in turn, was gauged using the same four

categories.

Before describing the study in more detail, two caveats need to be mentioned. First, a good part of what makes one individual more effective than another in an organization, according to Squires (1979), has to do with such endogenous personal characteristics as motivation level, disposition, ability to influence others, loyalty to an employer, and consistency, characteristics that are beyond the scope or sphere of a university's influence over students. These personal characteristics were consciously and purposely excluded from the elements of competence described in this study. Second, the study excluded an historical analysis of the tensions that have persisted between the university and the professional schools. A great deal of literature is already available on the subject of professional school/university tensions and it is not clear whether such an analysis would add to or detract from the study.

Studying Preparedness for Professional Practice

To determine the effectiveness of professional education programs as preparation for professional practice, both employers and professional school faculty were interviewed. The assumption was that partners, senior architects, and personnel directors in large firms, would have the experience from which to form opinions about what separates well prepared from inadequately prepared university graduates. Similarly, university deans and

faculty are the academic experts. Individual graduates, while they presumably gain from increased enlightenment in subject areas which interest them, were not sought as a definitive source of information for questions which ultimately involved matters of competence, performance, and effectiveness.

The design for the study utilized a simple demand and response format in which the requirements and expectations of business and industry, as interpreted by senior architects, were contrasted with university dean and faculty opinion. The architectural education/industry analysis on it's own was expected to be an interesting one. The congruence between the architecture industry and higher education would be better understood, however, if similar studies from other professional fields could be compared. To provide such a contrast and to increase the readers perspective the results of an earlier study by the author involving the fields of engineering and business management education would be introduced.

To define preparation for employment two initiatives were taken. First, a review of the literature involving employment preparedness in the professions was conducted. The studies completed by representative professional associations, especially at the national level, proved to be quite beneficial. Second, pilot interviews were undertaken. The input from practicing architects, in one case the Chairperson of the Education Committee of the CCAIA (California Council of the American Institute of Architects), proved to be particularly important in

forging a definition. Assuming it is possible to reach agreement on and delineate what industry considers an adequate preparation, there was still the problem of how to measure whether or not a particular school was providing that preparation. The general indicators of preparedness identified and tested in the preliminary interview stage were used to address this methodological problem.

Elements of competence were categorized based on earlier employment preparedness studies (Bisconti, 1980, Squires, 1979). It was assumed that if a student properly prepared for a profession, competence and effectiveness should follow. Competence was defined for purposes of this study as the state or quality of being capable of adequate performance. Competence is present, according to Trivett, "when an individual can demonstrate skills, knowledge, values, and attitudes, that are specified in some manner" (Trivett, 1975, p.10). A subtle but key word in this definition is demonstrate. Competency implies a connection between acquisition and demonstration of skills. Take the university professorate, for example. It is one thing to design and complete a research project, it is quite another to influence policy and decision making. How often do individual faculty research and development efforts reach the public policy formulation stage, not to mention implementation? There is a great deal to learn from successful professionals who are able to take an initiative from concept to reality.

The four elements or categories of competence were defined

as follows. 'Knowledge of field' included conceptual knowledge, experiential knowledge, theoretical knowledge, and contextual knowledge (Stark, 1989). 'Job skills' was separated into two groups, general skills such as leadership, adaptability, critical thinking, and specific skills such as decision making, planning, analytical and supervisory skills. 'Interpersonal skills' included written and oral communication, understanding oneself, understanding others, projecting a point of view, and image management. Finally, 'work attitude' included work ethic, moral qualities, work habits, industry understanding, and professionalism (see appendix A).

These areas of competence were investigated for importance as contributors to effectiveness on the job in the employer's view or in a faculty's view. To measure business and industry or professional school opinion, each element of competence was ranked as to importance by the interviewee. Subsequent review of the rankings were valuable in determining similarity and difference of opinion among architects as a group and educators as a group as well as the congruence or lack of it between architects and educators. Senior architects and faculty were also asked to embellish their responses with anecdotal information; this information revealed the informal and often unexplored practice and thoughts of people who work with employee preparedness problems everyday. The actual experiences of accomplished architects and educators were the foundation for explanation and understanding.

Selecting the Research Sample

Twenty-four large, medium, and small architecture firms from the Los Angeles area were chosen for the study. These were culled from an initial seven hundred and forty-nine firms in west and downtown Los Angeles. Seventy-two of the seven hundred and forty-nine firms were sent a letter of introduction and invitation to participate. All of the firms were members of the Los Angeles chapter of the California Council, American Institute of Architects. The chairman of the education committee for the Los Angeles chapter was instrumental in helping to identify those firms that, in his opinion, offered potential as rich sites for case study research of this nature.

The professional schools chosen for the study were the Graduate School of Architecture and Urban Planning at the University of California, Los Angeles, and the School of Architecture at the University of Southern California. Both schools had a tradition of providing the field with aspiring architects. Each site was chosen for its potential as a rich source of information, its accessibility, and the integral part it played in the industry locally.

The actual size and nature of the sample was determined by need and availability. In most cases a senior architect or partner was sought for interview. The interview questions used to solicit a ranking response were completed for all individuals.

Within each school deans and faculty were sought for interview. A total of twelve educators agreed to participate. Insight into the congruence between the knowledge, skills, and attitudes required by practitioners and the benefits or residue of a professional school education was sought. A total of thirty-five interviews were conducted with senior architects, professional school deans, and faculty members over a two month period.

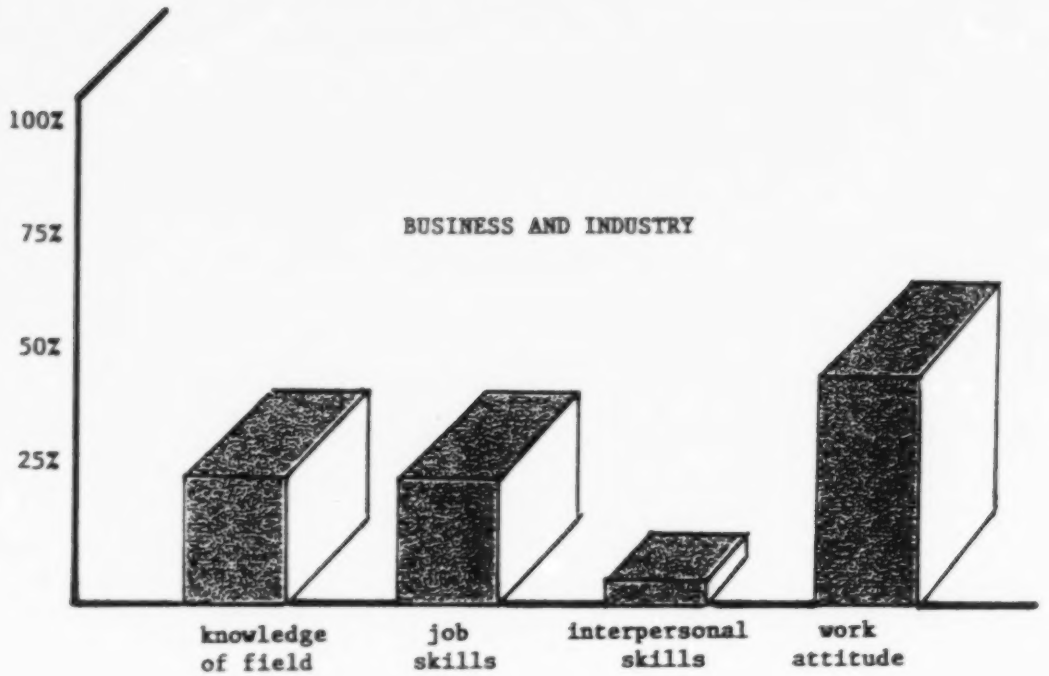
The Requirements and Expectations of Architects

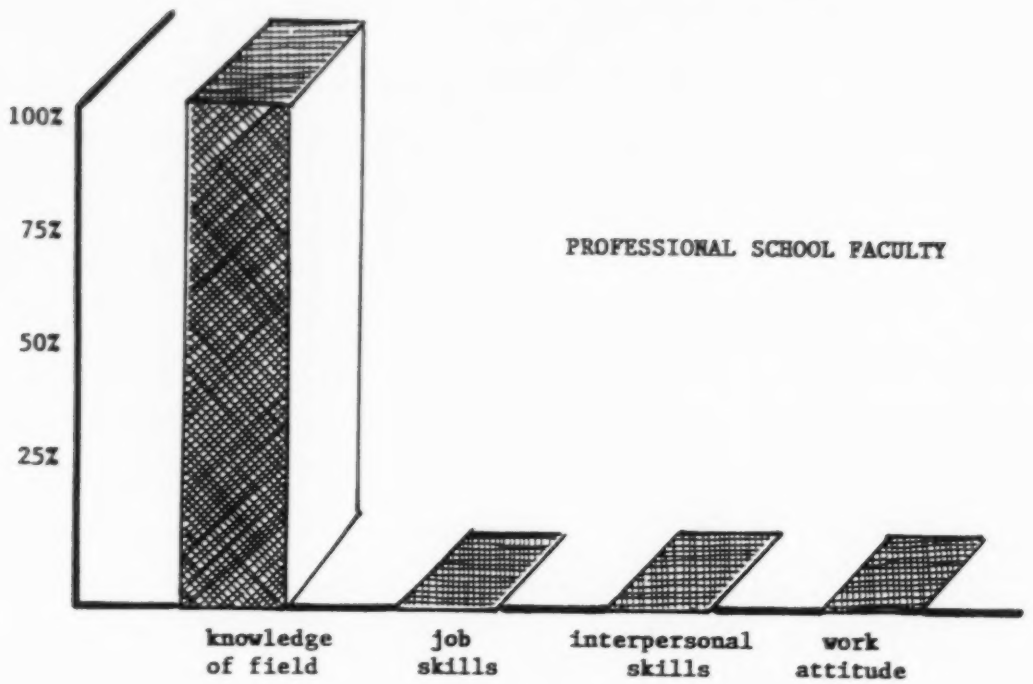
The contrast between the requirements and expectations of architecture practitioners and faculty is more substantial than one might predict. One hundred percent of faculty in a forced choice response chose 'knowledge of field' as the most important competence category. Less than 25% of the practising architects interviewed felt the same (see figure 1). 'Job skills', 'interpersonal skills', and 'work attitude' were, relatively speaking, not important in the opinion of faculty. Architects, on the other hand, felt quite strongly that 'work attitude' (40% response), 'job skills' (25% response) and 'interpersonal skills' (5% response) were what counted.

Comments from the architects interviewed were fascinating, especially with respect to the importance of work attitude. One veteran practitioner was adamant about the school's role in 'shaping' a commitment to the profession. Another recommended

FIGURE 1

COMPETENCIES CONSIDERED MOST IMPORTANT IN ARCHITECTURE
(% of people who ranked each competence first)





that faculty describe the profession better. "Give students a better sense of the profession," he demanded. This same practitioner felt faculty 'pandered' to students and suggested such faculty discontinue the 'popularity contest' notion. "Faculty have to be tougher and cull disinterested students. Remove the delusions, don't build them!" he asserted. The thread of discontent about student attitudes was evident in most interviews and was corroborated by one faculty member who conceded, "They do have a slightly inaccurate image of the profession."

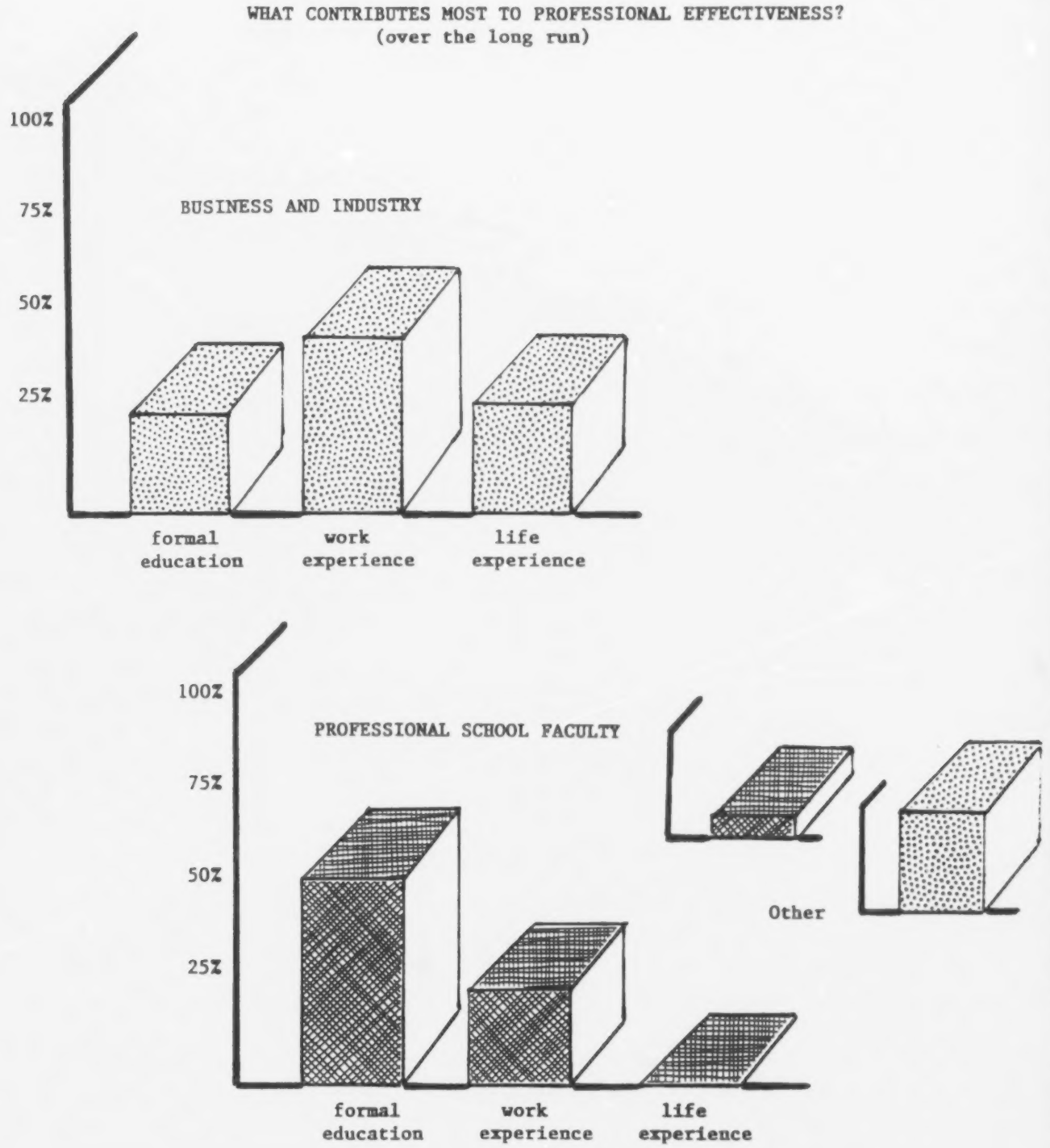
The importance of job skills was evident in the comments of interviewees as well. This quotation best describes what was generally felt: "I wish schools provided more technical skills, but really we have a responsibility to do this." Employers were prepared, albeit reluctantly, to accept responsibility for the specific job skills often learned on the job. Most often heard were comments related to the need for knowing or having a penchant for investigating building codes and regulations. "A litigious society has precipitated greater involvement with regulatory agencies," was the way one architect put it. Another 'job skill' competence around which interest centred was 'designing'. "The creative process needs some discipline. Put some structure to the thought process," stated one perceptive architect.

It isn't just a matter of articulating and illustrating one's ideas. "We tend to be too paternal," lamented another

veteran of practice; "We are not abrasive enough and we don't have the ability to openly question a viewpoint." Interpersonal skills were obviously of importance to this practitioner. In this same competence area another architect referred to 'establishing a view of yourself' as being important. "Students don't seem to be on fire," he went on. The importance of projecting a point of view and having that view recognized is becoming a valued competence.

The response comparing the importance of formal education, work experience and life experience was equally telling. Professional school faculty, predictably you might say, chose 'formal education' over 'work experience' and 'life experience' as contributors to professional effectiveness over the long run. Practitioners ranked work experience as the number one contributor with formal education and life experience as equal seconds (see figure 2). "You clearly learn more on the job than in school," stated one architect emphatically. Another faculty member and four practitioners preferred to think of some capabilities as outside the realm of education, work and life experience. 'Innate ability' somehow came into play, in their opinion. The comments from successful practitioners, most with a minimum of twenty years service, were summed up appropriately in these quotations: "Life experience cumulatively contributes to personal development," "University education provides introductory knowledge and skills only," "And, work experience is the basis for effectiveness, contribution, and state of the art

FIGURE 2


WHAT CONTRIBUTES MOST TO PROFESSIONAL EFFECTIVENESS?
(over the long run)
100%
75%
50%
25%
BUSINESS AND INDUSTRY
formal education
work experience
life experience
100%
75%
50%
25%
PROFESSIONAL SCHOOL FACULTY
Other
formal education
work experience
life experience

understanding".

The issue of congruence can be further explored in this illustration (see figure 3). Where should each competence be developed? School? Job? **or** Elsewhere? Documented here are the responses of both parties by category of competence. On the left we have business and industry, on the right the professional school. The **elsewhere** category included travel, professional development, and community and military service. Starting from the top with 'knowledge of field' and looking across, we see evidence of congruence between the practitioner and the educator. In this case both sides felt the school was the place to learn architecture knowledge. However, the similarity of opinion stopped here. Job skills (both general and specific), interpersonal skills, and work attitude categories illustrated a complete lack of agreement. It is worth noting that in the 'job skills general' and 'interpersonal' categories, faculty felt school, by far, was the best place to develop competence. When ranking each competence for importance (figure 1), faculty didn't pay much attention to either the job skills or interpersonal skills categories. This suggests that while 'job skills' and 'interpersonal skills' are not as important as 'knowledge of field', in the minds of faculty, they are, nevertheless, best learned in the professional school setting.

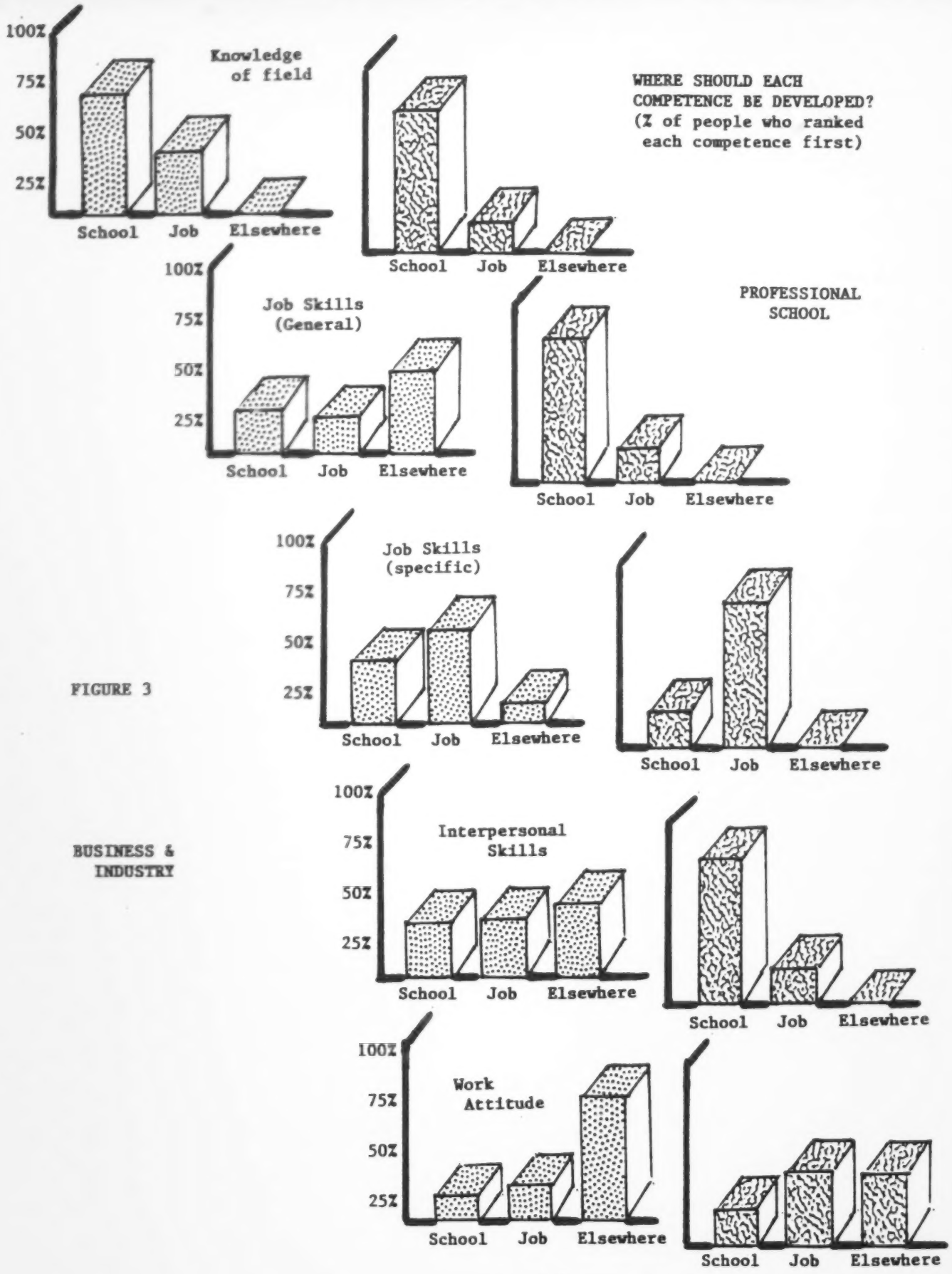

100%
75%
50%
25%
Knowledge of field
School
Job
Elsewhere
WHERE SHOULD EACH COMPETENCE BE DEVELOPED? (% of people who ranked each competence first)
School
Job
Elsewhere
100%
75%
50%
25%
Job Skills (General)
School
Job
Elsewhere
PROFESSIONAL SCHOOL
School
Job
Elsewhere
100%
75%
50%
25%
Job Skills (specific)
School
Job
Elsewhere
School
Job
Elsewhere
BUSINESS & INDUSTRY
100%
75%
50%
25%
Interpersonal Skills
School
Job
Elsewhere
School
Job
Elsewhere
100%
75%
50%
25%
Work Attitude
School
Job
Elsewhere
School
Job
Elsewhere

FIGURE 3

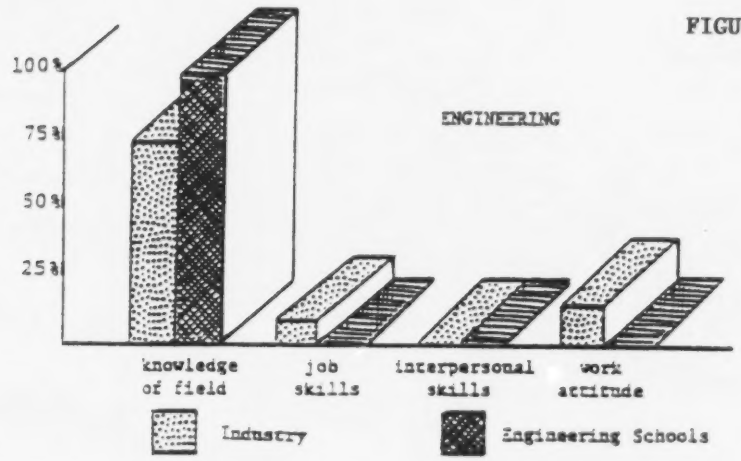
Engineering and Business Management Comparisons

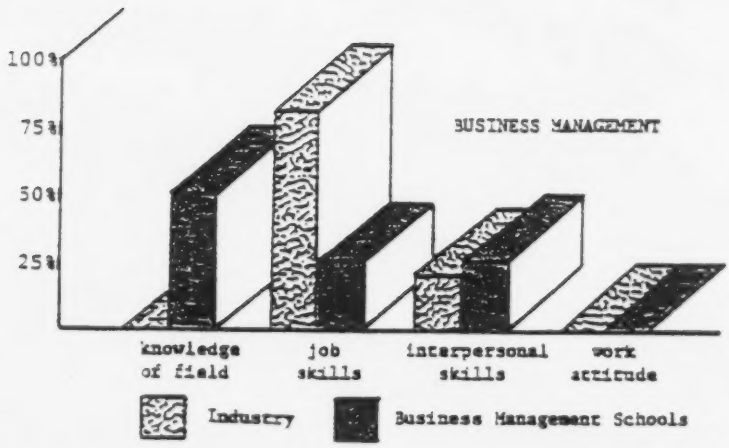
The study of congruence within the field of architecture takes on greater significance when compared to the fields of business management and engineering. Using similar definitions and questions from an earlier study (Hansen, 1987), it is possible to contrast, from a higher education perspective, how the professions differ and then speculate why they differ. In engineering (the industry explored was aerospace), for example, faculty and practitioners were in agreement for all four competence categories (see figure 4). The aerospace industry expected the schools to build the knowledge base while leaving the job skills, interpersonal skills, and work attitude for the workplace. In business management (in this case banking) little agreement existed. Knowledge of field was considered important by only 50% of the faculty interviewed. Other interviewees split their choices between job and interpersonal skills. Architecture faculty, as shown in this graph, were at least similar in sentiment to the engineers when it came to the knowledge base, even though not synchronized with practitioner opinion.

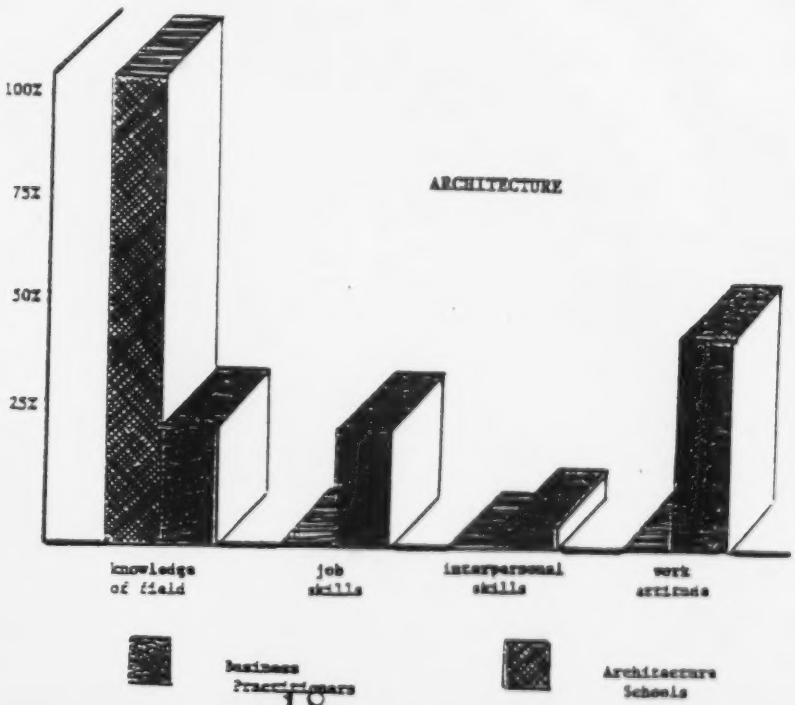
Despite the limited numbers in a multi-site case study of this nature the patterns were quite clear. What conclusions can be drawn from this study? Can these congruence patterns be explained? What can we learn from these three esteemed and essential professions?

COMPETENCIES CONSIDERED MOST IMPORTANT
(comparison of industry to professional
school for each field - % of first choices)

FIGURE 4







Conclusions and Implications

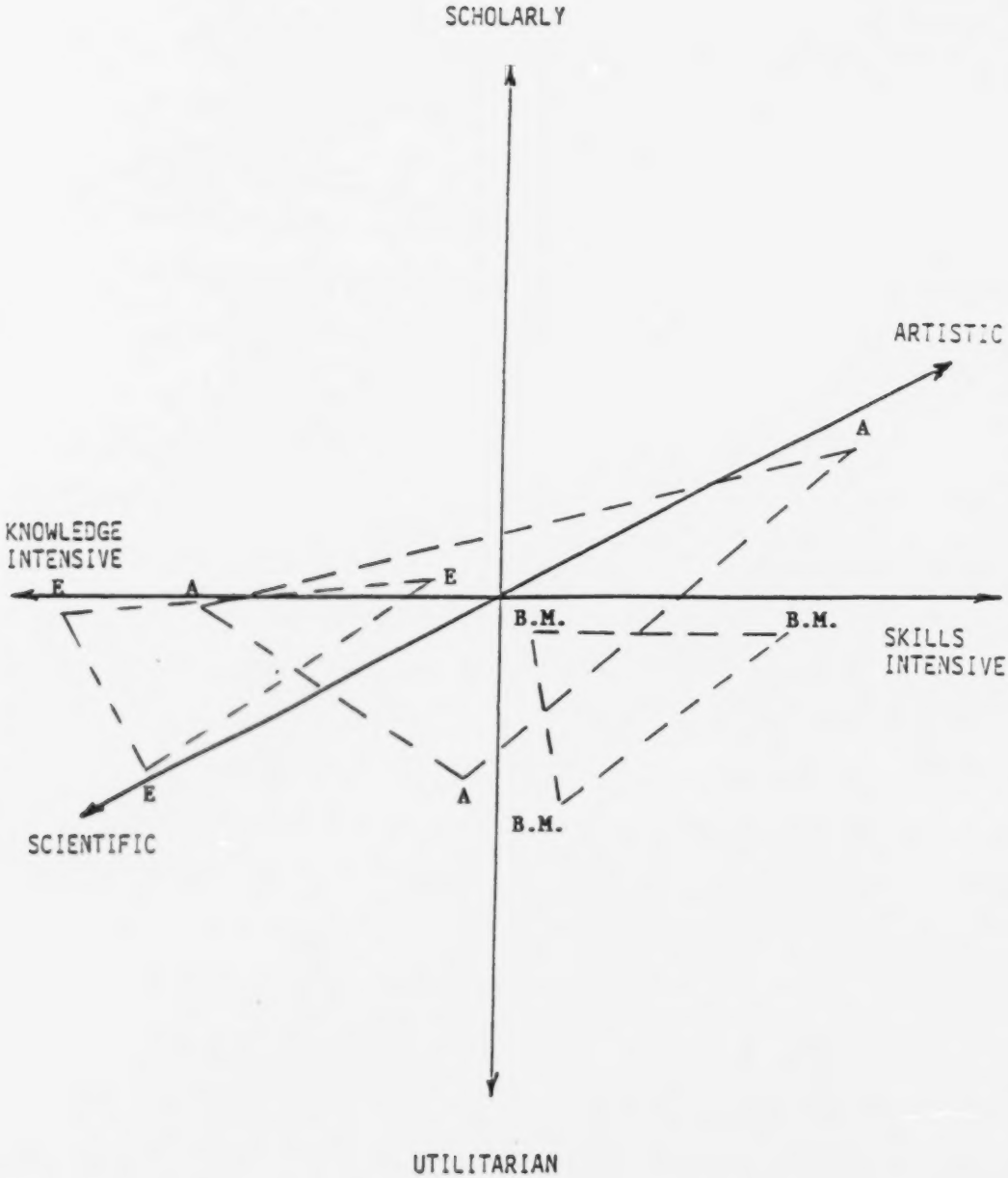
The research reported here focused on the importance of certain competencies over others. Which competencies were necessary and sufficient conditions for successful practice? Where were these competencies best learned? Moreover, how did the perceptions of veteran architects compare to those of university deans and faculty? The congruence between faculty and practitioner opinion was uneven. Successful practitioners in architecture pointed to the importance of knowledge, skill, and, interestingly, work attitude. Faculty were adamant that knowledge of field was all that mattered. Predictably, faculty felt formal education contributed more to professional effectiveness than work or life experience. Practising architects saw the benefit of all three with work experience as the number one contributor. The only agreement that existed regarding where each competence should be developed was in the knowledge of field area. Professional school faculty, despite their apparent indifference for job skills, interpersonal skills, and work attitude, as important competencies, perceived the professional school as the place to develop general job skills and interpersonal skills. Architects were more liberal in their choice. They could see such competencies being developed in

schools, on the job, and through other life experiences.

When architecture was compared to engineering and business management several general conclusions also emerged. How well the university prepared students for practice varied from field to field. Competence was an elusive concept. What mattered in one profession did not hold in another. Congruence, or lack of it, between the business and industry sector and the university, was unpredictable. Industry expectations of the professional school were relatively apparent. Industry was also prepared to accept responsibility for and take leadership in preparing aspiring professionals. The mission of the university, while not as ambiguous as we might think, especially in the eyes of business and industry, was not well understood.

The implications for change in the way aspiring professionals prepare themselves for effectiveness in the profession are numerous. Kolb's two-dimensional analysis of the structure of knowledge serves as a source of information for the following schemata. Could the structure of the subject matter in different fields have something to do with the degree of congruence found between business and industry demand and professional school response? While it is difficult to illustrate, figure 5 helps to describe the nature of the three professions compared in this study, especially the academic and experiential substance, or, if you like, the epistemology. Given this research I would place architecture (designated by the **A**) and engineering (designated by the **E**) to the left of the vertical centre line because each has a

FIGURE 5


SCHOLARLY
ARTISTIC
KNOWLEDGE
INTENSIVE
E
A
E
A
B.M.
B.M.
SKILLS
INTENSIVE
E
A
B.M.
SCIENTIFIC
UTILITARIAN

distinct body of knowledge, especially engineering! Business management (designated by the **B.M.**), by comparison, is more skills intensive and belongs right of centre. On the vertical dimension, engineering, by nature, is equally utilitarian and scholarly, thus it belongs in the middle. Architecture is more utilitarian than scholarly, and falls below the horizontal line. Business management is even more so. Along the scientific versus artistic dimension one could make the case that architecture is more artistic, engineering more scientific, and business management somewhere in the middle. Obviously, placing each profession is somewhat of an arbitrary exercise. Creating a graph, however, helps us conceptually. By connecting the points it is possible to define the parameters of what it takes to prepare for and be successful in each field (see figure 6). From this illustration, especially if you can imagine the ellipse-like shape created by the third dimension, it is possible to speculate to what extent the university has a role to play in the preparation process. Or, alternatively what curricula and process it would take to prepare people effectively for a particular field. Finally, this visual has implications for what criteria we use in admitting aspiring professionals into respective fields.

Note also the relative size of each area. Architecture, in words, is very broadly defined. Engineering, a very intellectually demanding field, is not as broad in scope as architecture. Engineers typically qualify for entry into the

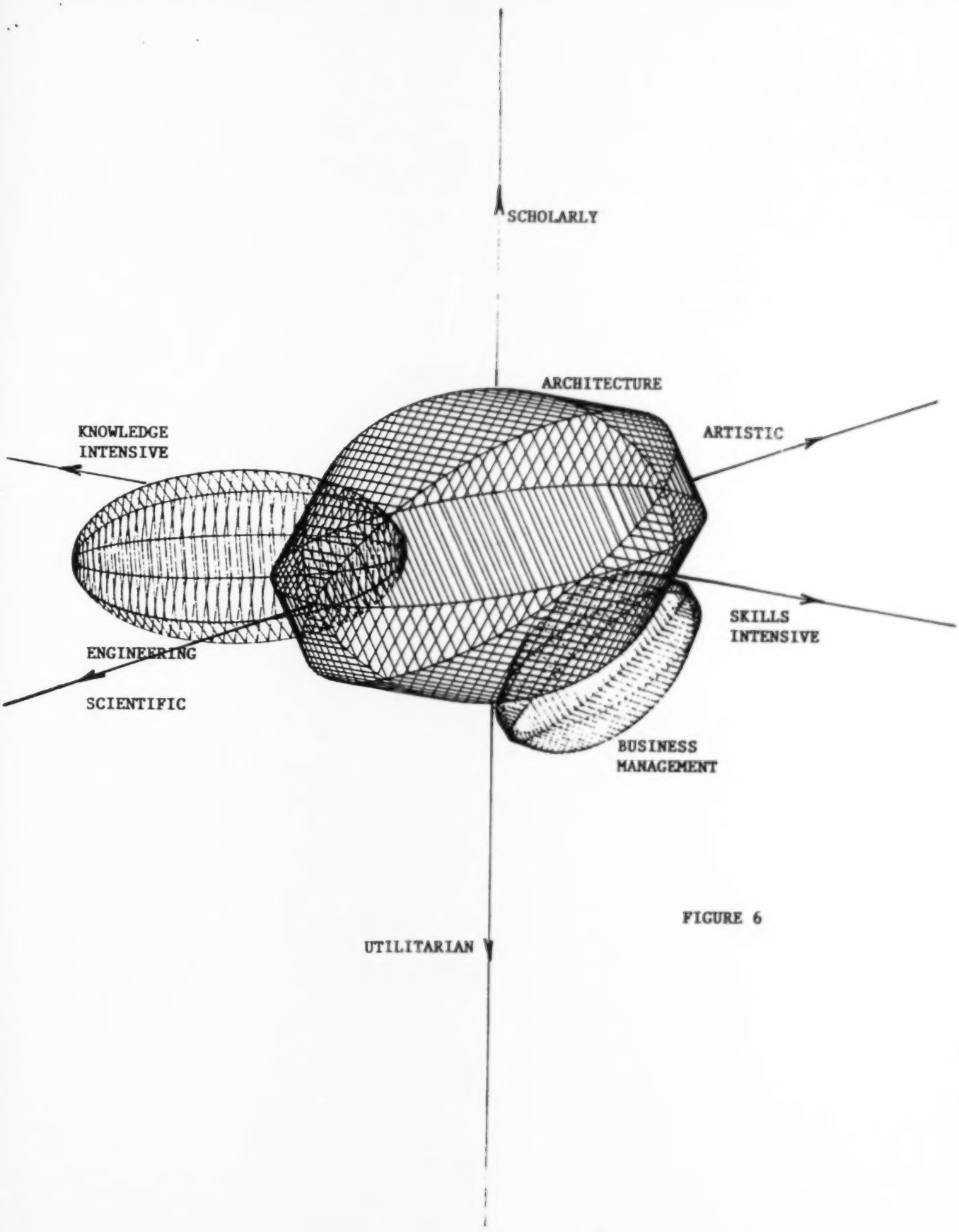

SCHOLARLY
ARCHITECTURE
KNOWLEDGE
INTENSIVE
ARTISTIC
SKILLS
INTENSIVE
ENGINEERING
SCIENTIFIC
BUSINESS
MANAGEMENT
UTILITARIAN

FIGURE 6

profession upon completion of a four year university program. Architects often complete both an undergraduate and graduate degree taking four to six years and then spend three to five years in practice before becoming licensed. Business management, by comparison, does not involve professional licensure and often requires only one or two years of graduate work beyond a first degree.

The opportunity for change in our professional schools, especially architecture, is enormous. The expertise of faculty is not in question. The rigor of both undergraduate and graduate programs is to be applauded. The willingness to consider how the curricular process should be defined, however, is missing. Also missing is a faculty or school agenda which addresses the preparation process from recruitment through to licensure. Is too little time available for reflection? Is the effectiveness of the learning process important? Are incentive systems for meaningful change available? In light of government, public, and now professional association cries for accountability, this seems an appropriate time to re-examine our professional school programs.

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APPENDIX A

CATEGORIES OF COMPETENCE

KNOWLEDGE OF FIELD

Conceptual Knowledge

Experiential Knowledge

Theoretical Knowledge

Contextual Knowledge

JOB SKILLS

General

- Leadership
- Adaptability
- Critical Thinking

Specific

- Decision Making
- Planning
- Analytical Skills
- Supervisory Skills

INTERPERSONAL SKILLS

- Communication Skills
- Understanding Oneself
- Understanding Others
- Projecting a Point of View
- Image Management

WORK ATTITUDE

- Work Ethic
- Moral Qualities
- Work Habits
- Industry Savvy
- Professionalism

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